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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of:

JACOBS ET AL.

Serial Number: 09/492,206

Group Art Unit: 1633

Filed: January 27, 2000

Examiner: E. Sorbello

For: USE OF BACTERIUM FOR MANUFACTURE OF A VACCINE

AMENDMENT

Assistant Commissioner of Patents
Washington, D.C. 20231

November 13, 2000

Sir:

In response to the Office Action mailed June 12, 2000, please amend the above-identified application as follows. A Petition for a two-month extension of time and Information Disclosure Statement accompany this response.

IN THE SPECIFICATION:

On page 1, after the title and before the first paragraph, insert as a separate paragraph -- This application is a continuation-in-part of USSN 09/123,735, filed July 28, 1998, now U.S. Patent No. 6,120,775, issued September 19, 2000. --

IN THE CLAIMS:

6. (amended) A method for protecting an animal against infection,

comprising [submucosally] administering submucosally a vaccine comprising a live attenuated bacterium.

REMARKS

In the Office Action mailed June 12, 2000, all the claims pending in the present application, claims 6 - 10, were rejected. Applicants respectfully request favorable reconsideration of the rejections and allowance of the present application in view of the above amendments and following remarks.

The specification has been amended to identify the present application as a continuation-in-part of USSN 09/123,735, filed July 28, 1998, and now U.S. Patent NO. 6,120,775, issued September 19, 2000. The present application and the '775 patent have common inventorship (i.e. A.A.C. Jacobs) and were co-pending at the time of filing of the present application on January 27, 2000.

Claims 6 - 10 were rejected under 35 USC 112, second paragraph, as indefinite based on the claim recitation "submucosally administering a vaccine..." This rejection is traversed in view of the above amendment switching the order of the claim terms to read "comprising administering submucosally a vaccine ..." This amended claim language based on the specification renders the amended claim 6 definite, and the same language was found acceptable in claim 1 of the enclosed '775 patent.

Claims 6 - 10 were rejected under 35 USC 103(a) as unpatentable over Hartford et al. (US Patent No. 5,895,654) in view of Russell (US Patent No. 4,521,513).

The Examiner acknowledged that in Hartford et al. the bacterium *Streptococcus equi* was administered intranasally, and that Hartford et al. "did not teach directly administering the vaccine to the

submucosal layer." The Examiner, however, maintained that Russell et al. corrects this deficiency by its disclosure of submucosal administration of a vaccine, and thus according to the Examiner "one of ordinary skill would alter the delivery method of any particular vaccine for optimizing or convenience, and would use any well known route." The Examiner then concluded that it would be prima facie obvious "to combine the method of preparation of the instant vaccine with a method of delivery presently routine in the art to result in the instant invention." This rejection is traversed for the following reasons.

The only route of administration for *Streptococcus equi* vaccines recognized by the art prior to Applicants' effective filing date of July 28, 1998 was intranasal administration, as addressed in the enclosed '775 patent. Specifically, column 2, lines 15 - 19, state: "The well-established importance of direct stimulation of the nasopharyngeal immune response has contributed greatly to the current opinion, that only the intranasal application of a vaccine can provide at least partial protection." The '775 patent also states in column 2, lines 7 - 10, with respect to a preferred embodiment of the present invention that "since the nasopharynx is the natural port of entrance for *Streptococcus equi*, it is now generally accepted that successful vaccination necessarily requires stimulation of the nasopharyngeal immune response." (citing Galan et al. and Timoney et al.) The '775 patent further states in column 2, lines 19 - 28, that despite the general problems with intranasally given live attenuated vaccines, that these disadvantages are however accepted in practice since intranasal vaccination is currently considered the only way to obtain at least partial protection.

Furthermore, Russell does not relate to *Streptococcus equi* infection, but instead relates to *Streptococcus mutans* infection, the vaccination against which is incomparable to vaccination against *Streptococcus equi* infection. Specifically, *Streptococcus mutans*

causes dental caries (i.e. holes in the teeth), and thus does not affect the interior of the host. In contrast, *Streptococcus equi* affects the interior of the host, causing acute disease of the upper respiratory tract in, for example, horses and thereby resulting in death.

For at least the above reasons, there would have been no motivation to combine the disclosure of the Russell patent with the Hartford patent to compensate for the deficiencies of Hartford. Specifically, one skilled in the art would not have been sufficiently motivated to combine Hartford (which teaches, for instance, in column 2, lines 48 - 49, that "[t]he nasal mucosa is the most common porte d'entree for *Streptococcus equi* infections," while failing to specifically teach or suggest submucosal or labial vaccine administrations) with Russell, which relates to an incomparable infection for vaccination purposes.

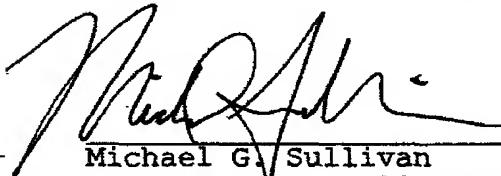
The non-obviousness of Applicants' claimed invention is further evidenced by the unexpected results obtained when administering a vaccine according to the claimed invention. These unexpected results are described, for instance, on pages 7 - 9 of the application, wherein the advantages of submucosal administration over intramuscular administration are shown for attenuated *Streptococcus equi* and *Streptococcus zooepidemicus* strains in horses (Example 2) and for bovine pathogenic bacterium *Actinomyces pyogenes* in cattle.

For at least the above reasons, the combination of the Hartford and Russell patents does not render the claimed invention prima facie obvious. Applicants thus ask that the rejection be withdrawn.

In view of the foregoing, the present application is now in condition for allowance. Reconsideration and favorable action are earnestly solicited.

If any fees are due in this application, please charge our Deposit Account No. 02-2334.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Michael G. Sullivan", is written over a horizontal line.

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